

Price 10¢

SCIENCE BUILT CIVILIZATION

TECHNOCRACY

SCIENCE
VS
CHAOS

TECHNOCRACY, INC.
HDQRS. R. D. 8141-8
24 So. High St. Akron, Ohio

BY

Howard Scott.
DIRECTOR
TECHNOCRACY,
INC.



SCIENCE MUST SAVE CIVILIZATION



There IS Something New Under the Sun

TECHNOCRACY—new, startling, fundamental—has invaded the mind of America with unparalleled positiveness and force.

Its original research summary, a simple statement of facts about the critical period through which we are passing, startled the world. The questions it posed still remain unanswered.

Technocracy not only made the American people fact-conscious, but confronted the entire nation with the necessity for fundamental social change.

Technocracy's position is based on facts, not rhetoric. Its message has cut deep. It has reached more intelligent and functionally important citizens in all walks of life than any other organization, and continues to do so.

Technocracy's scientific approach to the social problem is unique, and its method is completely new. It speaks the language of science, and recognizes no authority but the facts.

In Technocracy we see science banishing forever unemployment, hunger and insecurity of income.

In Technocracy we see science replacing an economy of scarcity with an economy of abundance.

In Technocracy we see functional competence displacing grotesque and wasteful incompetence, facts displacing guesswork, order displacing disorder, industrial planning displacing industrial chaos.

Technocracy is the attempt of science to build a civilization worthy of the intelligence of Man.

Technocracy concerns itself with the continental area of America alone. **TECHNOCRACY** marks a turning point in American history—the birth of a greater America. **TECHNOCRACY** contains all the elements out of which great movements are made.

Howard Scott, the founder and Director of Technocracy, Inc., presents in the following pages a diagnosis of the existing disorder and the design of a New America.

TECHNOCRACY

SCIENCE VS CHAOS

The following pamphlet represents the substance of an address given by Howard Scott before the National Technological Congress and the Continental Convention on Technocracy at the Morris Hotel, Chicago, Ill. in June, 1933.

Men Must Live

WHAT constitutes living? There are many and varied definitions, but, from the standpoint of the technologist, living is a term used to describe the functioning of any organism on the area in which it exists. Let us view living, then, in terms of function. All organic mechanisms require food, water, air, and solar radiation in some form or other. They are capable of motion, various metabolic changes, and reproduction. The human mechanism is differentiated functionally from all others in that it is the only one of the entire series capable of producing energy-consuming devices outside of its organic entity. The history of the human race may well be stated in terms of the ability of man to consume ever-increasing amounts of extraneous (non-human) energy. The limitation and stabilization of that rate of increase is the scientific problem of the not far distant future.

The human mechanism consumes energy in its processes of osmosis and diffusion; when such processes have reached a total consumption of 775,000 kilogram-calories per kilo of weight, these processes cease and the ensuing state is known as death. This cessation of osmosis and diffusion will occur on this consumption of energy, regardless of whether this consumption is attained in forty or eighty years, although death as a rule occurs due to other reasons previous to reaching the above critical total energy consumption. The human being radiates 912 small calories per square meter of surface per twenty-four hours, regardless of size, sex, age or disposition. It is not to be assumed here that all organic life has the same energy factors per unit of

weight in time. Cold-blooded animals, such as the snake or lizard, consume not in excess of 225,000 small calories per kilo of weight in their functioning lifetime.

Rates of Doing Work

LET us consider a few comparisons in the rate of doing work, i. e., expending energy.

The Khufu pyramid at Ghizeh has 2,300,000 blocks of stone weighing 5,900,000 tons; it required the labor of 100,000 men several months each year for twenty years to build this pyramid. If John F. Wallace had started in 1904 to dig the Big Ditch across the Isthmus of Panama at the same rate of doing work, the job would have been still under way in the year 2007, but not with John F. Wallace or any of the others who had started it. Even assuming that the knowledge of sanitation had been developed, under that rate of doing work, the problem would be just as difficult.

The Constitution of this country was written with a sickle and a spade. It took ninety-six man-hours to spade an acre of ground. If there had been no change in the rate of doing work, we would still have to live under the conditions of the Greeks, Egyptians, and Middle Ages. The things around us today are not possible under that former rate.

In ancient Egypt the currency was wheat. In the evolution of money, various commodities have been used successively: copper, silver, and gold. They started mining silver lead ores at Laurion around the time of the first Olympiad in 776 B. C. By 430 B. C. the hills of Attica were denuded of timber to be used in smelting silver ore. Mines were worked to depths as great as 600 feet. There was no hoisting machinery, so access to these mines was obtained by means of ladders. The miners carried the ore up out of the mines on their backs. Due to the fact that many of the openings in the mines were too small to permit the passage of an adult, the children of slaves were used extensively in these mining operations.

Adult slaves, chained in gangs of ten or twelve, worked in the larger openings in hand extraction of the ore deposit. Similar methods were used in the Seguntheum mines of ancient Spain. Under these methods of hand mining, a definite upper limit was soon reached, and this rate remained practically constant over long periods of time.

Energy and Physical Equipment

In the fifteenth century, in the Saxon mines, the introduction of gunpowder opened up new tunneling methods and went beyond the old methods' limit of the rate of doing work.

Over a long period of social history, from the time of the ancients to the invention of the steam engine, the rate of doing work, or the consumption of extraneous energy, remained practically constant; i. e., of the order of magnitude of 2000 kilogram-calories per capita per day. Modern China and India are contemporary examples of this same rate of doing work. When idealists speak of China today, they say, "If only we could raise the standard of living of those 470 millions of Chinese to that of our own."

Such idealism is foolish, for, due to the enormous population of China and the very limited supplies of coal, iron ore and other essential mineral products, it is quite impossible to increase the standard of living of the Chinese very greatly above that which they now have. It is interesting to consider the problem of famine in China. Aside from a few railroads and rivers, almost the only existing means of transport is the coolie. Consequently, in an area of famine, even though an abundance of food might be available at the railroad or river, it would not be possible by means of coolies to deliver food to the famine area at a distance greater than seventy-five miles from such a source of supply. This is due to the fact that, in making the trip of seventy-five miles and return, a coolie would require for his own sustenance all the food he had originally started with.

The ancient agriculturist was the person who provided the majority of energy for the social system of his time; in the old agrarian societies approximately ninety-three per cent of the total energy consumed was in the form of sustenance. Today seven per cent of the energy consumed in this country is for sustenance and ninety-three per cent goes to the operation of our physical equipment. The whole texture of the social fabric is altered.

Technical Processes Alter Rate

ONE hundred years ago we had a population of slightly over twelve millions. In the United States at that time seventy-five trillion B. T. U.'s of extraneous energy were consumed per annum. Our population at the last census was 122 millions, and in 1929 the energy consumption for this country was approximately 27,000 trillion B. T. U.'s. Thus in 100 years our population increased approximately tenfold, while our total extraneous energy consumption increased 353 times. This change has resulted from the introduction of many new technical processes.

Napoleon introduced tin cans. In 1929 we produced over twenty-two billion tin containers on this Continent, and 4,200,000,000 glass containers. Campbell's Soup Company is the largest consumer of tin cans in the world. In this same year 500 million tin cans were used by this one company in packing tomato soup alone.

All of these things are evidences of a great change in the rate of doing work. That rate has been accelerated in time. In 1896 William Jennings Bryan made his "Cross of Gold" speech. At that time there were 180,000 miles of American railroads, and almost 900,000 employes. In the meantime, the railroads in this country have grown in mileage, reaching the peak in 1916 with 254,000 miles. The peak in employment in American railroads was reached in 1920 with a total of 2,100,000. Since that time the trend in railroad employment has been, with minor oscillations, continuously downward; the figure was 919,000 in March, 1933.

Labor Power Displaced

Thirty years ago, on the Rutherford Branch of the Reading Railroad, a single freight train hauled 1100 tons of freight and required sixteen to twenty-four hours with a crew of six men to make the division run. The subsequent development of railroad motive power shows a far different picture. In 1928 the K-1 type of locomotive was introduced into this division. This engine hauled 7500 tons on that same division in four to six hours with a crew of five men. The net result of this increase in efficiency is that all of the men who were originally firemen are now unemployed, and all of the firemen's jobs are held by ex-locomotive engineers.

On the Lehigh, from New York to Buffalo, fast freight trains used to require two locomotives and a third was employed for express. Now a single K-1 type locomotive hauls the fast freight more quickly than the old express. Consequently a single K-1 type with one crew is doing the work formerly done by three locomotives and two train crews.

If we had the entire motive power of the American railroads modernized to the K-1 type or better, we would require only a very small number of the total railroad employes of 1929 to operate our railroads. We could further eliminate overhead if we abolished the present system of freight classifications and replaced it by a system similar to the parcel post of the United States Government. With such a combination of improved motive power and classification system, we could operate our railroads on 1929 volume with less than 500,000 employees.

Glass blowers used to be "born" into their occupations, until the engineer came along and devised a machine that could blow glass. This machine rapidly eliminated the glass-blower and represented the state of development the industry had attained by 1920. At that time many

people thought the mechanization of industry was at an end. Then Colburn introduced the technological process in glass manufacture, in which glass is no longer blown, but extruded in one continuous strip. Practically no human effort is required. One human being is needed to watch the control board. God didn't make him good enough to rival this machine in any other capacity.

The sheet process in steel manufacture used to be a hot and arduous one. That is gone. Now the job is quite clean and the running of a modern sheet steel plant requires the services of twelve men on the control bridge. Such a mill rolls sheets ninety-six inches wide at a rate as high as 760 feet per minute. All the human being has to do is watch the controls and read a magazine.

Scientific Approach

I AM giving you these illustrations for a purpose, because this is an entirely different approach to the social problem. We are not investigating or discussing human antagonisms. We are, instead, finding out how to do things functionally. The new method of functioning has come about not because we have a Price System but because of technology and its consequent production of change. Prior to the introduction of science and technology social change had been only a symptomatic sort, such as changes in beliefs, morals, ethics, and dynasties. The water in a river flows, but, if one looks at the same river in succeeding years, it shows in general very little alteration. This the physicist would call a **steady state**, since, although the water moved, the river shows no appreciable change. The same comparison may be used socially. Prior to the introduction of modern science and technology all social systems show very slight change in the dynamic sense as to the amount and ways and means of action, change in the technique of the means whereby men live. These past systems, may be said to represent a **social steady state**. It is only since and because of the introduction of technological procedures

that human social systems are undergoing extensive dynamic changes.

What Is Wealth?

NOW let us consider one of the most amazing of human inventions, wealth.

We define a Price System to be any social system whose means of exchange is based upon the use of one or more commodities as units of value. Price System wealth is in turn expressed in terms of the units of value and is negotiated in the more advanced stages by means of certificates of debt, gold, silver, or other readily portable commodities, but today more often mere pieces of paper. Ultimately, under an advanced Price System, the only valid wealth is monetary wealth, which in turn consists of certificates of debt. Therefore the only way to create wealth under such a system is by the creation of debt. Stocks, bonds, etc., are debt claims and must be paid in interest and principal. Interest provides expansion, allowing the continuous creation of debt.

At this moment there are in existence in this country 238 billion dollars of debt claims. As long as this Price System continues, these debt claims will remain valid. Abrogate these claims and you abrogate the Price System. The one basic rule of procedure under a Price System is that one must create debt claims against others faster than debt claims are created by others against him. If he does not succeed in doing this, he does not remain in business.

In the physical world, wealth, if one should wish to use the term at all, would be defined in terms of use, or the rate of consumption. Thus under a Price System the possession of the bonds of an automobile company would constitute financial wealth; whereas, in the physical sense, wealth as regards, say, automobiles would consist in being able to use them. Wealth in this sense consists not in the ownership of a car but in the act of wearing one out.

Science Now Has Social Objective

THE scientist views all the Price System concepts as nonsense, because in the physical world, which incidentally is the only world we can deal with, there is no such thing as value. There are, instead, only qualitative and quantitative analyses and measurements, such as size, weight, energy content, velocity, temperature, chemical composition, etc. These things can be measured and expressed numerically, but are not matters of value. The technologist is blamed to a certain extent because, in his creation of energy-consuming devices, he has played a mean trick on the Price System that nurtured him. Today every alert technologist knows that, whereas up to the present, in this country and elsewhere, scientific pursuits have been to a considerable extent cloistered, sporadic, and without objective, the concomitant technology has so altered social conditions as to set up a unidirectional social evolution. And in so doing technology has produced such an array of unsolved problems that the scientist, whether he likes it or not, is being forced out of his cloistered seclusion. Science itself, for the first time, must concern itself with the problem of a social objective. The technologist created energy-consuming devices which, as a result of cupidity in exploitation, have compelled in turn the further introduction and development of technological procedure. So, quite unwittingly, you see, the technologist has sprung another trick upon the entrepreneurs. For, if they continue to increase technical devices on this area, there will be but one outcome. For this there is no precedent. Science and technology have created their own ancestors. And for the first time circumstances will make it possible for us to live without the entrepreneur.

America Is Unlike Europe

I AM trying to give you a general background. In Russia throughout 1917—by way of contrast—ninety-two per cent of the population lived on the land. The conver-

sion of energy per capita on that area was of a low order of magnitude. Malpatre, in his book, "Coup d' Etat," points out that a handful of men were able to effect the change, taking over the power plants, telephone control, etc., of Petrograd. A technologist asks how many telephones there were, for instance, in Petrograd in 1917. The order of magnitude, in terms of the number of telephones installed and the number of kilowatts of electric power, was that of Passaic, New Jersey. The telephones and kilowatts of electric power of Newark, New Jersey, at the same time exceeded that of all Russia. The problem was really a small one compared with ours here.

Italy, similarly, has not the resources, land equipment, etc., for the introduction of Technocracy—not in Italy as an isolated unit, but only as a part of integrated Europe. Italy has sulphur, mercury, and hydro-electric power. She has no coal, iron, oil, nor most of the mineral resources necessary to industry. Fascism in Italy has consisted in the consolidation of all the minor rackets into one major monopoly.

Compared with England

Great Britain, too, has many movements for social betterment. Great Britain is changing and is seriously groping in a blind effort to meet the consequences of that change. But Great Britain's coal mines operate at an output of 0.8 ton per man per day, as compared with America's average of five tons per man per day. While, according to British geologists, only six per cent of the original reserve of Britain's coal has thus far been removed, they are mining in England shallow coal seams as thin as thirty inches, and thicker seams at depths as great as 3500 feet. The remaining iron ore in Great Britain is of such low grade that for smelting purposes an equal amount of imported high grade ore must be added to the ore produced domestically; that is, fifty-six per cent foreign beneficiation is necessary.

If coal were mined in Great Britain at the same rate per man as in the United States, there would be another mil-

lion unemployed miners to contend with. Sir George Paish and I have had several discussions about technological procedure in England. The British wanted to raise their standard of livelihood to the American level—with the same rate of production as we have here, by area, space, etc. In automotive transportation nine million cars would be required to raise England to our standard. Assuming that existing plants and structures remained the same, there would not be sufficient room to park this number of vehicles and certainly not enough to operate them. You have that condition in many parts of the world. Foreign trade is founded on that type of fallacy. It is not possible to change the other countries and to make them like this one.

Unemployment and Debt Claims

WHAT has been going on in this country during the last decade?

Since 1920 the production per man-hour as shown in 69,000 establishments, as compiled in the statistics of the U. S. Labor Bureau and the Industrial Conference Board, has been rising continually. Since 1930, to May 1 of 1933, the production per man-hour has risen 39.2 per cent.

What is the significance of this? According to figures checked by the Alexander Hamilton Institute, there were 17,000,000 unemployed May 1, 1933. A recovery to the 1929 level of production of goods and services would result in the full time reemployment of only 5,000,000 of those now unemployed. All we have to do is to increase that rate, and Roosevelt and the present administration in the National Industrial Recovery Act will step on the gas. The National Industrial Recovery Act does some beautiful things. It says to the bondholders that there will be a guarantee of interest and principal. It tells widows and orphans they will be cared for. To manufacturers it says that profits will be increased, the market guaranteed, and production levelled off.

It is doubtful if any of these things will be accom-

plished, except the latter. It is certain that not all of them will be accomplished, because several of them are mutually exclusive. If you level off American industry, there is no chance to create debt fast enough to operate the physical equipment. If you can not create debt, you cannot maintain a Price System. Technology throws people out of work. It is wiping the bottom out of all values. If you eliminate the possibility of growth and therefore can not continue to create debt, then the interest rate and return on investments will approach zero. Under such a condition it would be possible, in fact probable, that if you did deposit money in a bank, you would not be able to get the same amount out, since the bank would have to charge for the privilege of depositing. How can we continue to operate under this fallacious financial setup?

What We Have, What We Might Have

ON THE other hand, the operation of this continent from a technological viewpoint has tremendous possibilities. On this side of the picture Technocracy has made some interesting calculations. If the wheat of this country had to be produced with a spade, it would take 5,000,000 men to produce 800,000,000 bushels. If the soil were tilled with the best equipment, it would take less than 5000 men to produce 800,000,000 bushels per annum. Or consider the subway system; the total number of people employed in a subway fare collection system is greater than the total number of employees actually operating the mechanical equipment of the system, including the power plant. From an energy standpoint it is cheaper to provide free local transportation.

This type of calculation requires that we dispense with a number of old habits of thought. Take the matter of the kind of income we could afford to have. We have been conditioned to the idea that jobs are different and men are different and therefore justly receive different compensations. Consider, however, the fact of the enor-

mous expenditure of effort necessary to keep the records to maintain this differentiation of income among the people of this Continent. It becomes technically unsound to attempt to differentiate between incomes when there is plenty for all, because of the cumbersomeness and costliness of such practice. We have arrived at this, not from any philosophy of right and wrong or human equality, but from the simple technical reason that to do otherwise would cost too much.

How would such a system work? In all social orders, until today, men have been penalized to live. Some particular group has always discovered that under the rules of the game it could gain advantage. Means to prevent this did not exist. If technologists were operating this country, they could not afford to penalize anyone. The cost of collecting would be greater than the advantage gained and, moreover, this would upset the income balance of the country.

Energy Vs. Money

UNDER a technological system, money as we now know it would no longer exist. Debt could not be created. There would be a medium of distribution but not one of debt value or exchange. This medium of distribution would have to satisfy the following conditions:

1. It would designate by functional number the goods or services purchased.
2. It would designate the purchaser by function and by sex, and show whether the purchase was made prior to, during, or after the fulfillment of his energy contract (service period with the Technate).
3. The point of origin and point of consumption of the goods or services would be shown numerically.
4. It must be non-exchangeable between individuals and consequently not susceptible to being lost, stolen, or bestowed as charity.

5. It will be valid only for the time period for which issued, which period is determined by the time required to make one complete industrial cycle (for the North American Continent this period is about two years). One's income, being valid only for the time period for which issued, can not be saved. It can only be spent or else forfeited.

The purchasing power of the individual would depend upon the operation of the physical equipment and would be a prorated division of the energy consumed in the given area during the given time period, after the deduction of that part of the total energy spent in the construction of plants, etc., and fixed charges for such other items as are not directly distributable to individuals. Thus the income of the individual can be altered only by a change in the rate of expenditure of energy by the social mechanism as a whole.

The only way for an individual under Technocracy not to participate in this income would be:

1. To leave the Continent permanently.
2. To commit suicide.
3. To induce the state to execute him.

Energy Certificates

THESE energy certificates, issued to individuals, would resemble somewhat a cross between a traveler's check and an ordinary bank check. They would be similar to a bank check in that they would represent no denomination until a purchase of goods or services had been made, and the denomination of the cost of that particular transaction would then be indicated on the certificate surrendered in the process. They would resemble a traveler's check in that they would be issued to a particular individual and would not be valid except as identified by that individual. Hence they could not be stolen, exchanged, or given away, and would be useless in the hands of any other person.

On this certificate would be a number, according

to a system similar to the library cataloging system, identifying the person to whom issued by function and geographical position.

Diagonally would be a color band, one diagonal to designate a male, the other a female. The holder of a male certificate would not be allowed to purchase female apparel, and vice versa. Thus, one's relations to the opposite sex would depend entirely on personal merits, because for the first time it would be impossible to purchase favors.

The background of this certificate would be one of three colors. If the first, it would signify that the holder had not yet begun the fulfillment of his or her energy contract for services to the Technate. If a second color, it would signify that the holder was engaged in the fulfillment of such an energy contract. If a third color, that would signify that such fulfillment had been completed and the owner had retired.

The income of the individual would continue until death. This income is not to be thought of as in any manner a payment or reward for services done. True, the individual is expected and required to fulfill a period of service according to his capacity and ability during his lifetime, but the income is a per capita share of the net available energy and is not allotted on a man-hour participation basis.

The Four-Hour Day

ONCE such a system was beyond the preliminary stages of reconstruction, such a period of service should not exceed four hours per day, four consecutive days at a shift, and 165 days per year. For a period of about twenty years, say, from the ages of twenty-five to forty-five, this period of service would be known as the fulfill-

ment of the energy contract. The income received, however, made possible by virtue of our possession of energy reserves, would be several times the present average income in this country, and many times greater than any possible contribution of services by any individual.

Purchasing would be effected by means of surrendering energy certificates properly identified in return for goods and services. The cost of any particular commodity would be determined entirely by the energy consumed in the process of its production and delivery to the point of consumption. There would be no profits. The entire physical equipment of this Continent would, of course, be owned and operated by the Technate. Every item of goods or services would, in the functional numeration system mentioned above, bear its own particular catalog number. Should an energy certificate be surrendered in payment for any commodity or service, it would be cancelled by having punched through its face the functional number of the item purchased. It would then be pushed through photo-electric control recording machines, which deduct from the inventory the item purchased, and simultaneously, from the purchaser's account, the amount of the item purchased.

Since the system of certificates and accounting used would be uniform throughout the Continent, all inventories and accounts would be relayed continuously by wire to central headquarters, where in this manner would be maintained a complete and up-to-the-minute inventory of the physical operation of the entire Continent as to rates of production, stocks on hand, and rates of consumption.

The rates of consumption would be ascertained by sorting the energy certificates cancelled, such sorting to be done photo-electrically, according to the status of the purchaser, the geographical division, and the item purchased, providing the maintenance of complete statistical tabulation, even to minute details, of every significant physical and social operation.

An Economy of Abundance

THE operational as well as the sociological implications and possibilities of such a controlled system are astounding. The quality of goods to be produced would no longer be the cheap and shoddy variety turned out at present. Instead the criterion by which goods would be judged would be the energy cost per unit of service, and those goods would be produced which by experimental test were found to cost the least energy expenditure per unit of service.

The Technate would not be interested in the expansion of consumption for its own sake, since no profits can accrue. On the contrary, the need of conserving our raw materials would discourage wasteful practices of all kinds. There would be no advertising or salesmanship. As any large retailer or advertising concern now knows very well, but for such practices the present consumption of goods would be considerably reduced. It follows that in a Technocracy, where a very ample variety and quantity of only the best goods would be available for all, the rate of consumption, instead of expanding ad infinitum, would probably tend to contract, or at least reach a state of equilibrium at a moderately simple mode of living.

Improvement Under Science

Thorstein Veblen, in "The Theory of the Leisure Class," ably discussed the "canons of conspicuous waste" and the "pecuniary canons of taste," as induced by the existence of a Price System. Once revoked, as they would be under a non-Price System of equal income for all, it follows that social rivalry, which seems an inherent characteristic of the human species, would have to find other means of expressing itself. Consequently, if one found it impossible to display one's superiority to the Joneses by virtue of being able to live more pretentiously, one would be obliged to find some more substantial manner of self-expression. The chief channel for that would

be the performance in the social system of a more important or responsible task than that of Jones.

In matters of design of equipment practically nothing would be left unaffected. It goes without saying that the most efficient and automatic processes that could be devised would be used wherever possible. Under such a control the use of automatic machinery would not, as now, result in the evils of unemployment, but instead would lighten the burden of all by equal amounts. All industry, all social functions, would be conceived and operated on a Continental scale. This again is not a philosophic premise, but is based on the fact that, under a high energy system, every individual piece of equipment is dependent for its own operation upon the operation of the system as a whole. Since this is so, it is imperative that the considerations concerning single units be secondary to the prime consideration of the operation of the complete mechanism.

Industrial Integration

A homely illustration may suffice to make this clear. Suppose that a group of designing engineers is assigned the task of designing an automobile. One, shall we say, is a carburetor expert; a second, an ignition expert; a third, a transmission expert, etc. Now it would be possible for each of these men to focus his attention on his own particular specialty, and create that part as a separate entity with a high degree of perfection; yet the complete car, while composed of perfect parts, when assembled would perform very imperfectly. This might be due, for instance, to the fact that the carburetor was of a capacity sufficient for a small car, whereas the designer of the chassis called for a car twice that size, and other similar types of misfits.

If, however, the procedure had been reversed and it had been specified that the car should carry a given number of passengers, should perform at a given speed with a gasoline consumption of a certain number of miles per

gallon, then in order to meet these specifications, the separate parts may vary in pattern only within strict limitations. In other words, it is not possible by haphazard integration of perfect parts to achieve a perfected whole. Conversely, however, if the performance of the whole is specified, the limitations of the parts are automatically determined.

The whole, in the case under consideration, is of course the entire social mechanism. The specifications are that it shall perform in such a manner as to provide economic security with equal income from birth until death, at a high energy standard of living, to each and every member thereof, at the lowest necessary expenditure of human effort and non-recurrent natural resources. The fulfillment of these specifications automatically affects every functional sequence within that social mechanism. As a convenient illustration on this greater scale, we may consider the problem of housing 150,000,000 people at a minimum standard of housing per person.

Scientific Housing

THIS is not a problem in architecture. It is a problem of construction and maintenance of buildings. It involves a consideration of materials. Materials must be chosen of which there are ample quantities, eliminating from serious consideration the so-called metal houses talked of by some of the modern architects. It demands material much more durable than used in houses of today. Since a house is an operating mechanism, and therefore an energy-consuming device, in order to keep the energy cost at a minimum, insulation must be carefully considered. This and many more conditions are implied as a consequence of the requirement that housing 150,000,000 people shall, when operated as a whole, fall within given operating specifications.

Attacking the problem of housing in the converse sense, as has been customary and is still the basis of most of our current architecture, it may be remarked that

there is no design or composite of designs in existence, in the past or present of architecture, adequate to meet the above requirements. Architecture, as it is now practiced, occupies exactly the same role with regard to the problem of housing as did the various experts in the case of the automobile mentioned above. When housing is viewed as a problem of construction, operation and maintenance at a minimum standard for 150,000,000 people, architecture as it is now constituted, essentially individualistic and anarchic, will cease to exist.

Exactly the same line of reasoning applies to every necessary functional sequence from agriculture to education, communication, or public health.

Era of Peace and Plenty

I HAVE attempted to point out something of the evolution and the rate of acceleration in the immediate past in the technique in the means whereby we live. I have indicated that, due to the introduction of technological procedures, which are totally without historic precedent, we are witnessing the initiation of a social change which is unidirectional and irreversible. I have shown that, due to these technological processes, under a Price System unemployment has resulted and will continue to increase; that the growth curves of industry during the fifty years from 1870 to 1920 were expanding at a compound interest rate, that they have been flattening out, and that this process started prior to 1920. This is evidence of industrial growth maturation. As a consequence unemployment will be even more highly accelerated, and the interest rate will tend to approach zero, due to the inability to create further debt. The total consequence of these simultaneous trends will be an unprecedented social impasse as long as operation is continued in accordance with the rules of the game of a Price System.

On the other hand, I have pointed out that, with the greatest array of productive equipment on the earth's surface, with the lion's share of the earth's natural re-

sources, and with the largest technically trained and functionally competent personnel in existence, this Continent stands ready to move from an economy of scarcity and poverty into an era of peace and plenty.

It's An Engineering Job

I HAVE indicated a few of the details of what such a system would be like. I have not inquired as to whether you do or do not like the idea. The events that are going to occur in this area within the very near future are not going to be respecters of human likes or dislikes. The problem of operating any existing complex of industrial equipment is not and can not be solved by a democratic social organization. The executive of the telephone company is not consulted as to whether he likes the design of the telephone, nor is the general public. With few exceptions, you know nothing at all about a telephone except, that by following a certain routine, someone answers at the other end of the line. That is all you need and, for the most part, all that you want to know.

The problem of operating the entire industrial equipment of this Continent is a technical problem so far transcending any other technical problem man has yet solved that many individuals would probably never understand why most of the details must be one way and not another; but the services of everyone, in the highest capacity at which he can perform, would be needed.

Fortunately, it has been demonstrated that, once the basic necessities of economic security have been achieved at a not uncomfortable expenditure of personal effort on our part, we are so constituted physiologically that, by a rapid process of habituation, we find and pronounce such circumstances to be good.

Read
“TECHNOCRACY”

The Official Publication

\$1.50 for 12 issues

TECHNOCRACY, INC.
250 East Forty-third Street
NEW YORK CITY



“Technocracy” will always present the closest approximation possible from the existing data, and when more and better data are made available, closer approximations will be rendered. The scientific, factual basis of the technological functioning of this continental area will be presented free from the prejudices of partisan politics, race, creed or color. It will always be free from the Billingsgate of personalities so prevalent in the present political world.

ILLUSTRATED!

*The Most Outstanding Magazine Published on the
North American Continent Today!*

Subscribe Now!

TECHNOCRACY, INC.
BOXES: R. D. 8141-8
14 S. High St. Akron, Ohio

**No political party is capable
of instituting a planned
economy of abundance on
the North American
continent**

**If you think so, investigate
the facts uncovered by
Technocracy, Inc.**

Functional Control Is Imperative

